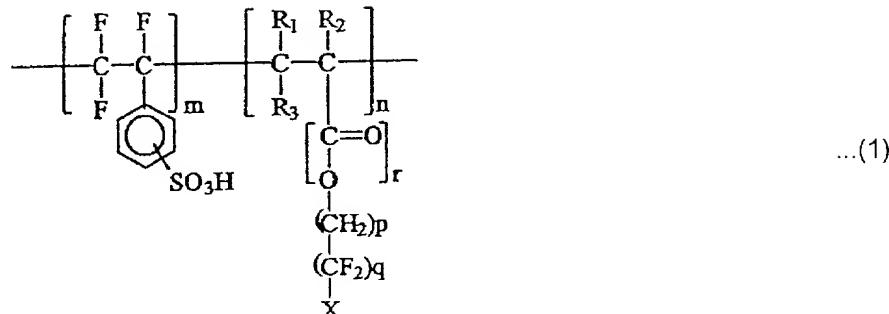


What is claimed is:

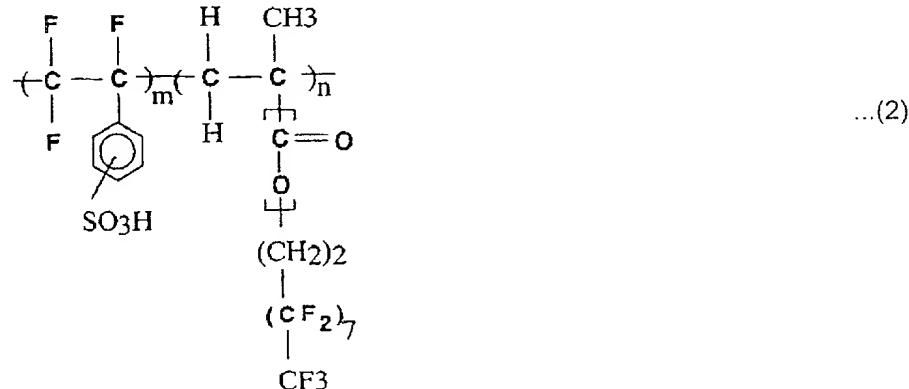
1. A partially fluorinated copolymer having formula (1):



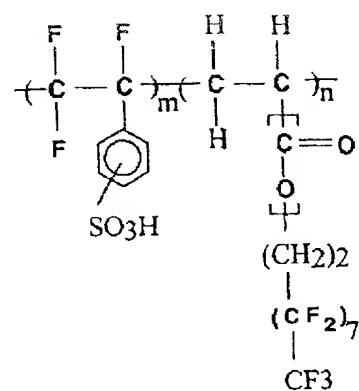
14 wherein each of R₁, R₂ and R₃ independently is selected from the group consisting
15 of F, H and CH₃; X is a hydroxy group or a trifluoromethyl group; m is an integer
16 greater than zero; n is an integer greater than zero; and p, q and r are zero or
17 integers greater than zero.

1. The partially fluorinated copolymer of claim 1, wherein, in formula (1),
2 m is an integer from 1 to 50, n is an integer from 1 to 50; p is zero or an integer from
3 1 to 12; and q is zero or an integer from 1 to 12.

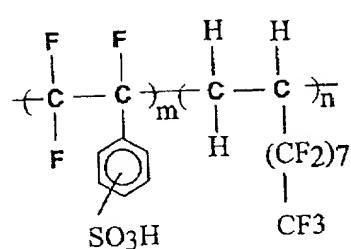
1. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer having formula (1) is a compound having one selected from
3 formulas (2) to (5):



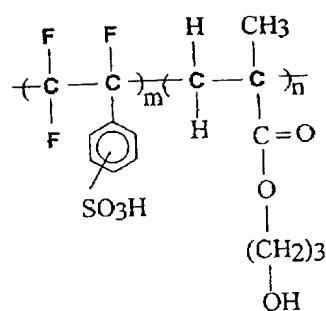
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... (3)



... (4)



... (5)

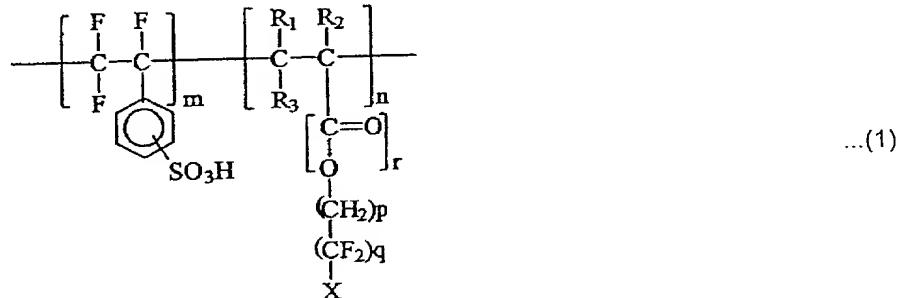
50 where m is an integer from 1 to 50; and n is an integer from 1 to 50.

1 4. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer having formula (1) has a weight average molecular weight of
3 about 30,000 to about 500,000.

1 5. The partially fluorinated copolymer of claim 1, wherein the partially
2 fluorinated copolymer is partially crosslinked using a crosslinking agent.

1 6. The partially fluorinated copolymer of claim 5, wherein the crosslinking
2 agent comprises at least one selected from the group consisting of divinyl benzene,
3 diallyl ether, triallyl ether, diglycidyl ether and ethylene glycol dimethacrylate.

1 7. An ionic conductive polymer membrane comprising a partially
2 fluorinated copolymer having formula (1):

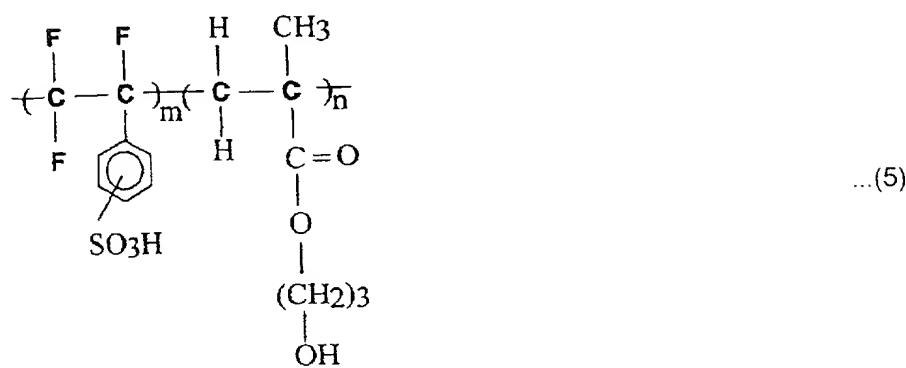
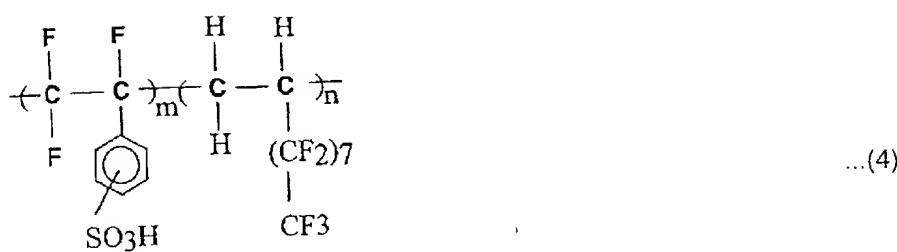
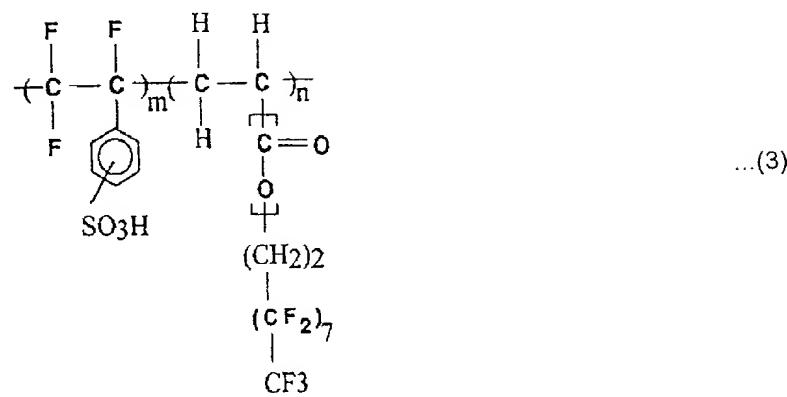
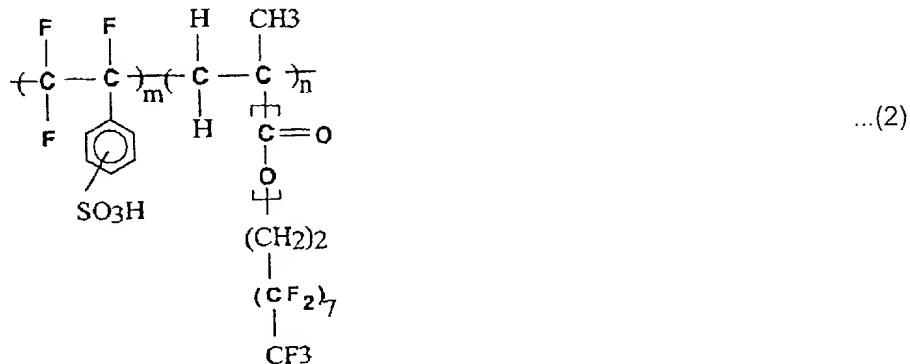


wherein each of R_1 , R_2 and R_3 independently is selected from the group consisting of F, H and CH_3 ; X is a hydroxy group or a trifluoromethyl group; m is an integer greater than zero; n is an integer greater than zero; and p , q and r are zero or integers greater than zero.

1 8. The ionic conductive polymer membrane of claim 7, wherein, in
2 formula (1), m is an integer from 1 to 50, n is an integer from 1 to 50; p is zero or an
3 integer from 1 to 12; and q is zero or an integer from 1 to 12.

1 9. The ionic conductive polymer membrane of claim 7, wherein the

2 partially fluorinated copolymer having formula (1) is a compound having one
3 selected from formulas (2) to (5):



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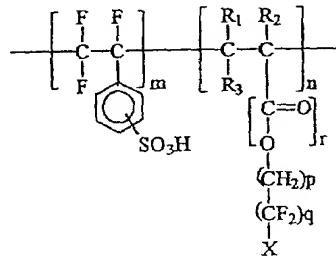
42 where m is an integer from 1 to 50; and n is an integer from 1 to 50.

1 10. The ionic conductive polymer membrane of claim 7, wherein the
2 partially fluorinated copolymer having formula (1) has a weight average molecular
3 weight of about 30,000 to about 500,000.

1 11. The ionic conductive polymer membrane of claim 7, wherein the
2 partially fluorinated copolymer is partially crosslinked using a crosslinking agent.

1 12. The ionic conductive polymer membrane of claim 5, wherein the
2 crosslinking agent comprises at least one selected from the group consisting of
3 divinyl benzene, diallyl ether, triallyl ether, diglycidyl ether and ethylene glycol
4 dimethacrylate.

1 13. A fuel cell comprising an ionic conductive layer, the layer comprising a
2 partially fluorinated copolymer having formula (1):



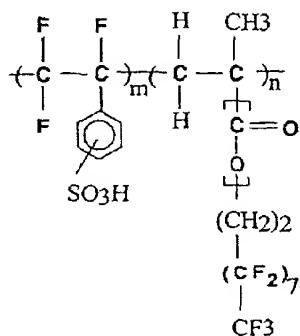
10 ... (1)

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13 wherein each of R_1 , R_2 and R_3 independently is selected from the group consisting
14 of F, H and CH_3 ; X is a hydroxy group or a trifluoromethyl group; m is an integer
15 greater than zero; n is an integer greater than zero; and p , q and r are zero or
16 integers greater than zero.

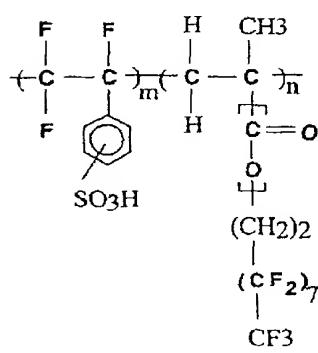
1 14. The fuel cell of claim 13, wherein, in formula (1), m is an integer from 1

2 to 50, n is an integer from 1 to 50; p is zero or an integer from 1 to 12; and q is zero
3 or an integer from 1 to 12.

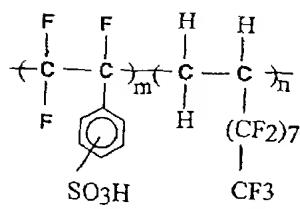
1 15. The fuel cell of claim 13, wherein the partially fluorinated copolymer
2 having formula (1) is a compound having one selected from formulas (2) to (5):



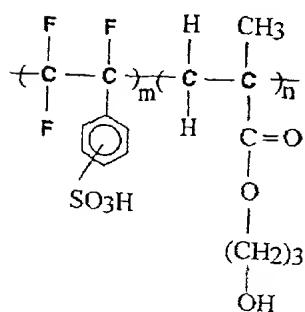
... (2)



... (3)



... (4)



... (5)

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41 where *m* is an integer from 1 to 50; and *n* is an integer from 1 to 50.

1 16. The fuel cell of claim 13, wherein the partially fluorinated copolymer
2 having formula (1) has a weight average molecular weight of about 30,000 to about
3 500,000.

1 17. The fuel cell of claim 13, wherein the partially fluorinated copolymer is
2 partially crosslinked using a crosslinking agent.

1 18. The fuel cell of claim 17, wherein the crosslinking agent comprises at
2 least one selected from the group consisting of divinyl benzene, diallyl ether, triallyl
3 ether, diglycidyl ether and ethylene glycol dimethacrylate.
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